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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/686,704	10/17/2003	Hisaki Kurashina	117086	8807

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EXAMINER

NGUYEN, THANH NHAN P

ART UNIT	PAPER NUMBER
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2871

DATE MAILED: 07/28/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/686,704

Applicant(s)

KURASHINA ET AL.

Examiner

(Nancy) Thanh-Nhan P. Nguyen

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 4/13/2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-13, 15-16 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-13, 15-16 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 17 October 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f):
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08).
Paper No(s)/Mail Date 10/17/03; 4/29/05.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

This communication is responsive to amended dated 4/13/2005. Claims 1-13, and 15-16 are pending for examination; claim 14 is cancelled.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter, which the applicant regards as his invention.

Claim 12 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Referring to claim 12, the language "the data lines including main line portions which extend above the scanning lines so as to intersect the scanning lines and overhanging portions which overhang from the main line portions along the scanning lines," and "convex portions being formed in regions which are to be gaps between the pixel electrodes adjacent to each other by interposing the scanning lines in plan view due to the presence of the overhanging portions on the base surfaces of the pixel electrodes on the substrate." is indefinite as the meaning is not understood. What constitutes overhanging portion cannot be determined as what is overhung is not identified, and what constitutes a convex portion cannot be determined as what layer or layers the convex portion is in is not identified. Therefore, for the examination purpose, that limitation has been assumed to mean that there are pixels. Further, after amended

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claim 12, limitation "overhanging portions which / being formed to overhang from the main line portions" has been repeated. For the examination purpose, "the overhanging portions being formed to overhang from the main line portions" (last limitation in the claim) will not be considered.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1, 3, 6-8, 11, and 15-16 are rejected under 35 U.S.C. 102(b) as being anticipated by Sato (U.S. 2002/0018278).

Referring to claim 1, Sato discloses an electro-optical device comprising, above a substrate (10): a data line (6a') extending in a first direction; a scanning line (3a) extending in a second direction and intersecting the data line; a pixel electrode (9a) and thin film transistor (30) disposed so as to correspond to an intersection region of the data line and the scanning line; a storage capacitor (70') electrically connected to the thin film transistor and the pixel electrode; a light shielding layer (300') disposed between the data line and the pixel electrode; an interlayer insulating film (43) disposed as the base of the pixel electrode; and a contact hole (85) formed in the interlayer insulating film, to electrically connect the thin film transistor to the pixel electrode; and a dielectric film (75') constituting the storage capacitor including a plurality of layers

including different materials and also forming a laminated structure including a layer made of a material having a higher dielectric constant than the dielectric constants of the other layers; the entire region inside the contact holes being filled with a filler (16), [figs. 1, 3, 17].

Referring to claim 3, Sato discloses another contact hole (83) being formed in another interlayer insulating film (41, 42), and the entire region inside the other contact hole being filled with the filler, [fig. 17].

Referring to claim 6, Sato discloses a coating member (ITO material) being formed on the inner surface of the contact hole (85), and the filler (16) being formed on the coating member, [figs. 3, 17; and considered ITO material of pixel electrode 9a as a coating member].

Referring to claim 7, Sato discloses the filler (16) being made of a polyimide material, [fig. 17; par. 0106].

Referring to claim 8, Sato discloses the contact hole being formed in light-shielding regions corresponding to a position in which the scanning line and the data line is formed, [fig. 17].

Referring to claim 11, Sato discloses a relay layer (71a') being electrically connected between one of the pair of electrodes constituting the storage capacitor and the pixel electrode, [fig. 17].

Claim 15 is met the discussion regarding claim 1 rejection above.

Claim 16 is met the discussion regarding claim 1 rejection above, and also see fig. 18.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 2, 4-5, and 12-13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sato in view of Zhang et al (U.S. 6,396,470), or Matsushima (U.S. 6,806,932).

Referring to claim 2, Sato lacks disclosure of the surface of the interlayer insulating film being planarized. However, it was well known to have the surface of the interlayer insulating film being planarized for the benefit of flattening or leveling the substrate, as evidenced by Zhang et al, [fig. 16], or by Matsushima [fig. 2].. Therefore, at the time the invention was made, it would have been obvious to a person of ordinary

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skill in the art to have the surface of the interlayer insulating film being planarized for the benefit of flattening or leveling the substrate.

Referring to claims 4-5, Sato et al lacks disclosure of the filler being made of a light-shielding material, or a transparent conductive material.

It was well known that filling the contact hole(s) with a conductive member so as to electrically connect predetermined ones of the electrodes each other via the conductive member, and also, by filling the contact hole(s), the orientation of the liquid crystal molecules will not be disturbed at an area corresponding to contact hole(s). And it was evidenced by Matsushima, the filler (26) being made of a light-shielding material (Ti), [see fig. 2]; it was also evidenced by Zhang et al, the filler being made of a transparent conductive material (ITO), [see fig. 16]. Therefore, at the time the invention was made, it would have been obvious to a person of ordinary skill in the art to have contact hole(s) being filled with a light-shielding material, or with a transparent conductive material for the benefit of having electrically connect predetermined ones of the electrodes each other via the conductive member, and not having the orientation of the liquid crystal molecules disturbed.

Referring to claim 12, Sato et al discloses the data lines including main line portions which extend above the scanning lines so as to intersect the scanning lines; a counter electrode (21) facing the plurality of pixel electrodes (9a) being formed on a counter substrate (20) disposed to face the substrate; convex portions being formed in regions which are to be gaps between the pixel electrodes, [fig. 17].

Even though Sato lacks disclosure of a first pixel electrode group inversely driven in a first period and a second pixel electrode group inversely driven in a second period complementary to the first period, it was an intended use limitation and therefore does not patentably distinguish the invention.

Referring to claim 13, since claim 13 is a product-by-process claim, determination of patentability is based on the product itself; the patentability of the product does not depend on its method of production, [MPEP 2113]. For the examination purpose, this claim will be examined as the product itself, and therefore, claim 13 is met the discussion regarding claim 12 rejection above.

Claims 9-10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sato in view of Yang (U.S. 5,429,962).

Referring to claims 9-10, Sato discloses an electro-optical device comprising, above a substrate (10): a data line (6a') extending in a first direction; a scanning line (3a) extending in a second direction and intersecting the data line; a pixel electrode (9a) and thin film transistor (30) disposed so as to correspond to an intersection region of the data line and the scanning line; a storage capacitor (70') electrically connected to the thin film transistor and the pixel electrode; a light shielding layer (300') disposed between the data line and the pixel electrode; an interlayer insulating film (43) disposed as the base of the pixel electrode; and a contact hole (85) formed in the interlayer

insulating film, to electrically connect the thin film transistor to the pixel electrode; the entire region inside the contact holes being filled with a filler (16), [figs. 1, 3, 17].

Sato lacks disclosure of the data line being a laminated structure of an aluminum film and a conductive polysilicon film; and the data line being formed of the same film as one of a pair of electrodes constituting the storage capacitor.

Yang discloses the data line formed of polysilicon (11) and a metal layer (12) (commonly, e.g., Al, Cr, Mo), [col. 3, lines 66-68; col. 4, lines 1-16], for the benefit of preventing breakage of the data line, [col. 4, lines 37-42]. Therefore, at the time the invention was made, it would have been obvious to a person of ordinary skill in the art to have the data line being a laminated structure of an aluminum film and a conductive polysilicon film for the benefit of preventing breakage of the data line. Further, the data line being formed of the same film as one of a pair of electrodes constituting the storage capacitor achieves advantages such as cost reduction, product yield, as a common goal in the art.

Response to Arguments

1. Applicant's arguments filed 4/13/2005 about Rejection claim 12 under 35 U.S.C 112, second paragraph have been fully considered but they are not persuasive since the arguments and the proof as on pages 7 and 8 of the Remarks do not support the arguments. Therefore, claim 12 rejection under 35 U.S.C 112, second paragraph is still maintained.

2. The indicated allowability of claims 10 and 14 is withdrawn in view of the newly discovered reference(s) to Sato (U.S. 2002/0018278) and Yang (U.S. 5,429,962). The rejections now based on the newly cited reference(s).

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure:

Sato (U.S. 2002/0018278).

Zhang et al (U.S. 6,396,470).

Matsushima (U.S. 6,806,932).

Yang (U.S. 5,429,962).

Any inquiry concerning this communication or earlier communications from the examiner should be directed to (Nancy) Thanh-Nhan P. Nguyen whose telephone number is 571-272-1673. The examiner can normally be reached on M-F/9-5:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Robert Kim can be reached on 571-272-2293. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

(Nancy) Thanh-Nhan P Nguyen
Examiner
Art Unit 2871
-- July 22, 2005 -- *TN*


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